

PATENT SPECIFICATION

806,982



Date of Application and filing Complete

Specification: May 29, 1956.

No. 16532/56.

Application made in Switzerland on Feb. 21, 1956.

Complete Specification Published: Jan. 7, 1959.

Index at acceptance:—Classes 20(4), D(1:7), T: 39(3), H1(E:X); and 64(2), G1A(5:X).
International Classification:—E04f, F24d, H05b.

COMPLETE SPECIFICATION

Improvements in or relating to Surface Coverings

I, BENNO PALATINI, of Blumenbergplatz 7, St. Gallen, Switzerland, of Swiss Nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a surface covering adapted for use in landing fields, 10 streets, floors, walls and the like.

It is already known for preventing cracks in coverings of large dimensions and in order to increase the resistance thereof, to provide the covering with a grid-like insert in- 15 terstices between the grid walls thereof being filled with an appropriate building material constituting the uppermost surface.

According to the present invention a surface covering of this type is formed of ele- 20 ments, each of which comprises a grid-like structure of regular shape, the grid being formed of intersecting walls, each wall being at least double and closed at its upper surface to form a passage, the edges of the ele- 25 ment being provided with means for interconnecting it with further identical elements to form an extended grid-like surface enclosing cells bounded by the intersecting walls, these cells being capable of being 30 filled with a structural material such as concrete to form a hard-wearing yet substantially non-cracking surface covering.

This arrangement imparts to the surface covering a great flexibility permitting its in- 35 stant adaption to inequalities of the subsoil and also permitting its following of slight movements of the subsoil.

Other features and advantages of the invention will become apparent from the de- 40 scription now to follow of a preferred embodiment thereof, given by way of example and in which reference will be made to the accompanying drawings, in which:

Fig. 1 is a perspective view partially in 45 section of a completed surface covering ac-

cording to the invention;

Fig. 2 shows, also in perspective view, a grid element used in this surface covering; and

Fig. 3 is a section taken along line III— 50 III of Fig. 2 through the grid element shown in this figure and through an adjacent grid element.

With reference to Fig. 1 the subsoil to be provided with a surface covering is design- 55 ated by 1. Preferably this subsoil is made air- and watertight by an appropriate process previous to its provision with the covering hereafter described. A grid-like struc- 60 ture generally indicated by reference numeral 2 is then laid on to the subsoil 1. This structure 2 is formed of a plurality of square grid elements one of which is illustrated in Fig. 2. Into the free spaces or cells formed 65 between the grid walls there is brought an appropriate structural material, preferably concrete, which is suitable for producing an uppermost covering fulfilling the desired conditions. This structural material com- 70 pletely fills these spaces without any joints and is divided by the grid walls into a plurality of separate cells 3 of building material. Owing to the small dimensions of each concrete cell formation of cracks is practi- 75 cally excluded. Each grid wall of the structure is double-walled and closed at its upper end so as to form, as clearly visible from Figs. 1 and 3, in cross section an inverted U. As the open side of each of these U lies on the air- and watertight subsoil 1 80 conduits or passages 4 are produced between the double walls of each grid wall, which passages communicate all with each other. In order to produce surface coverings of large dimension in the described manner sev- 85 eral elements identical to the one illustrated in Fig. 2 are connected to each other as visible from Figs. 1 and 3. In order not to interrupt the intercommunication of the pas- 90 sages 4 between adjacent elements and fur-

ther to prevent entering of air from the atmosphere into these passages 4 at the junction of two elements the edges of each of the elements are constructed in such a manner that lobes 5 of one element engage into the near-by cells of the adjacent element so that also between two adjacent elements there are formed passages 4 which are hermetically sealed from the atmosphere thus permitting heating of the covering by a heated medium as hereafter described.

At two sides of each element the grid walls are staggered with respect to the marginal edges as shown at 6, in that the height of the overlapped portions is about the thickness of material less than the height of the other parts. It results from this arrangement that even if several elements are connected to each other the upper edges of all elements lie in one plane which at the same time constitutes the surface of the covering (Fig. 1). In order to permit additional expansion the lobes 5 may be somewhat broader than shown.

The grid-like elements may be made from any appropriate flexible material. Preferably use may be made of synthetic resin materials such as for example nylon or any other polyamide.

Owing to the twin-walled arrangement of the grid walls with air cushioning in between the whole described surface covering has a great flexibility permitting its intimate adaptation to unevenness and rugged inequalities of the subsoil. At the same time the division of the covering material into a plurality of small-dimensioned cells permits use of a structure material which is substantially harder than the subsoil so that the present invention renders possible to provide a subsoil with a very hard and resistant surface covering in which no cracks occur upon changes in the configuration of the subsoil owing to the fact that the tensile and compression stresses are taken up by the great number of small-dimensioned cells 3 and even more by the structure 2 itself.

As visible from the drawing the arrangement of the structure 2 is such that all passages 4 communicate with each other. This permits heating of the surface covering in a very simple manner by feeding a heating medium for example hot air or steam through the passages 4 hermetically sealed against the atmosphere. Preferably hot air will be fed at one end of the covering into all passages 4 extending parallelly to each other in one direction and for this purpose these may be made with a larger cross-section than the passages 4 extending transversally thereto. Of course it is also possible to insert heating wires into the grid elements as is shown at 7 in Fig. 3 and in this case the surface covering may be heated electrically. This last mentioned method has the advantage

that the heating zone is brought into immediate vicinity of the surface and simultaneously treatment of the subsoil in order to render it air-tight is made unnecessary. The advantages which result from the possibility of heating this covering for example the surface of landing fields for aircraft, of streets and the like certainly need not be particularly mentioned here.

The possibilities of use of the surface covering according to the present invention are various. Besides the already mentioned use in landing fields for aircraft it may be used for highways, streets, sidewalks, garage floors and even for floors in apartments and the like.

Instead of being heated the surface covering could of course also be cooled and then it may be used in cold-storage or refrigerating plants.

Instead of being twin-walled the walls of the grid elements enclosing the cells may also have a greater number of partitions.

Of course the surface covering according to the invention may also be brought on to already existing surface coverings for example on to concrete plates and the like.

WHAT I CLAIM IS:—

1. An element for use in constructing a surface covering for aircraft landing fields, streets, floors, walls and the like, which element comprises a grid-like structure of regular shape, the grid being formed of intersecting walls, each wall being at least double and closed at its upper surface to form a passage, the edges of the element being provided with means for interconnecting it with further identical elements to form an extended grid-like surface enclosing cells bounded by the intersecting walls, these cells being capable of being filled with a structural material such as concrete to form a hard-wearing yet substantially non-cracking surface covering.

2. An element according to Claim 1, which is of rectangular shape, the walls intersecting at right angles.

3. An element according to Claim 1 or Claim 2, in which the walls are of inverted U cross-section.

4. An element according to any of Claims 1 to 3, in which the interconnecting means are such that when the element is joined to an identical adjacent element the passages formed by the walls extend through from one element to the next without interruption.

5. An element according to Claim 4, in which the passages formed by the walls extending in one direction are of larger cross-section than those extending in a second direction.

6. An element according to any of Claims 1 to 5, in which the interconnecting means comprise lobes at two adjacent edges designed to fit over the one of the other two

edges of an identical adjacent element, the walls at the other two edges being of correspondingly reduced height so that in the assembled structure the upper surface lies in one plane.

7. An element according to any of Claims 1 to 6 made from a moulded synthetic resin.

8. An element according to Claim 7, in which the synthetic resin is a polyamide.

10 9. A surface covering formed by an array of interconnected elements according to any of the preceding claims, the cells between the intersecting walls being filled with a structural material such as concrete.

15 10. A surface covering according to Claim 9, in which means are provided for heating the structure.

20 11. A surface covering according to Claim 10, in which the said heating means comprise electric heating wires inserted in the walls of the elements.

12. A surface covering formed by an array

of interconnected elements according to Claim 4 or Claim 5, in which a heating medium such as hot air or steam is passed through the passages formed by the walls, or through at least those passages of larger cross-sections.

13. An element for use in constructing a surface covering for aircraft landing fields, streets, floors, walls and the like, arranged and constructed substantially as described with reference to the accompanying drawings.

14. A surface covering for aircraft landing fields, streets, floors, walls and the like, formed by an array of interconnected elements substantially as described with reference to the accompanying drawings.

BARKER, BRETTELL & DUNCAN,
Chartered Patent Agents,
16, Greenfield Crescent, Edgbaston,
Birmingham, 15.

806982
1 SHEET

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale*

A technical cross-section drawing of a stepped concrete structure, likely a retaining wall or foundation. The structure consists of several horizontal layers of concrete blocks, each reinforced with a grid of steel reinforcement bars (rebar). The rebar is shown as a grid of intersecting lines within each concrete layer. The structure is built on a sloped ground surface, which is indicated by diagonal hatching. The drawing is labeled with numbers 1 through 4, corresponding to the legend:

- 1: Reinforcement (steel bars)
- 2: Concrete
- 3: Soil (ground surface)
- 4: Foundation (base layer)